

How to Evaluate Players Using Statistics ?

Carlo Favero

Valuing Players

- Step 1. Use models to determine the value of a player's stats
- Step 2. Adjust for position: compute relative wins production
- Step 3. Move from relative wins to total wins
- Step 4. Adjust for team statistics

Model based values for players stats

TABLE 6.5
The Value of Various NBA Statistics in Terms of Wins

Various Statistics Tracked for Players and Teams	If each variable increased by one, and nothing else changed, wins would change by . . .	If each variable increased by 100, and nothing else changed, wins would change by . . .
SCORING STATISTICS		
Three-point field goals made	+0.066	+6.6
Opponent's three-point field goals made	-0.066	-6.6
Two-point field goals made	+0.033	+3.3
Opponent's two-point field goals made	-0.032	-3.2
Free throws made	+0.018	+1.8
Opponent's free throws made	-0.018	-1.8
Missed field goals	-0.034	-3.4
Missed free throws	-0.015	-1.5
POSSESSION STATISTICS		
Offensive rebounds	+0.034	+3.4
Turnovers	-0.034	-3.4
Defensive rebounds	+0.034	+3.4
Team rebounds	+0.034	+3.4
Opponent's turnovers	+0.034	+3.4
Steals	+0.034	+3.4
PERSONAL FOULS AND BLOCKED SHOTS		
Personal fouls	-0.018	-1.8
Blocked shots	+0.021	+2.1

Model based values for players stats

- aggregate, with appropriate weights
 - scoring statistics
 - possession statistics
 - personal fouls and blocked shots.
- adjust individual player's contribution for time on court

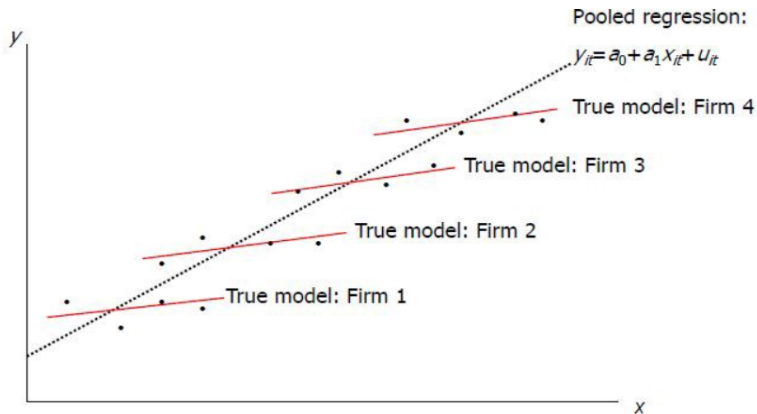
Personal Foul and Blocked Shots

- personal foul and block shots are not in our model because they do not enter in the efficiency measures.
- We "price" these two variables by projecting one of the variables in our efficiency measure on them

$$OFT_{it} = \beta_{0,i} + \gamma_{0,t} + \beta_1 PF_{it} + u_{it}$$

- note that the regression includes a "team dummy" and a "time dummy"

Understanding Panel Data Regression



Fixed Effects Estimation:

Time and position adjustment

- adjusting for role: find the difference between the average player in a specific role and the average player overall
- find relative wins by subtracting to each player wins the adjustment for role
- put each player on court for 48mins to adjust for time spent on court

Adjustment for team performance

- measure relative team performance as the difference between the team productivity in defense and the team's pace with respect to the average team.
- this adjustment is small and the ranking obtained using team adjusted and team not adjusted stats is the same.

TABLE 6.8
Evaluating the Accuracy of Wins Produced, 2003–04 Regular Season

Teams	Summation of Player Wins Produced	Actual Team Wins	Difference in Absolute Terms
San Antonio	60.4	57	3.44
Detroit	56.7	54	2.75
Indiana	56.6	61	4.41
Minnesota	55.8	58	2.21
Sacramento	54.6	55	0.38
Dallas	53.1	52	1.15
LA Lakers	51.7	56	4.31
Memphis	47.8	50	2.23
New Jersey	47.5	47	0.52
Houston	45.9	45	0.90
Milwaukee	43.8	41	2.85
Denver	43.7	43	0.73
Miami	42.3	42	0.28
New Orleans	40.7	41	0.26
Seattle	39.3	37	2.31
Golden State	39.1	37	2.10
Portland	37.9	41	3.10
Utah	37.6	42	4.41
New York	37.1	39	1.89
Boston	36.8	36	0.82
Philadelphia	34.3	33	1.27
Cleveland	33.9	35	1.06
Toronto	33.1	33	0.09
Phoenix	30.6	29	1.64
Atlanta	28.5	28	0.55
LA Clippers	28.5	28	0.53
Washington	25.7	25	0.68
Chicago	23.7	23	0.70
Orlando	22.0	21	0.96
AVERAGE ERROR			1.67

The NBA Efficiency Measure

$$EFF = PTS + REB + AST + STL + BLK \\ -FGMISS + FTMISS - TOV$$

Do Wages Reflect Efficiency ?

- Use regression analysis to assess the performance of efficiency in explaining wages
- Interpretation of Results
 - Outliers
 - non-linearities
 - consider the residuals by type of player